# DAQ Overview

## Murrough Landon – 6 July 2000

## Overview

- Long term: Final system
  - Use cases
  - Architecture
- Medium term: slice tests
- Short term: ROD tests
- Dormant issues
- Personnel

# Final System (1)

## Use Cases

- Acquire events during physics run
  **Requires:** ATLAS DAQ infrastructure; ROD firmware
- Monitor events during normal run
  **Requires:** Monitor skeleton; l1calo monitor code
- Acquire events during calibration run
  **Requires:** ROD crate DAQ; l1calo readout code
- Setup/start/stop normal physics run
  **Requires:** l1calo run controller, l1calo database
- Setup/start/stop calibration run
  **Requires:** as normal run plus calorimeter software

The first item requires the least from us but is the only one we wont need for the slice tests!

# Final System (2)

## Architecture

- Several ROD crates (3-10)
- Require VME 64x capable crate?
- CPU per crate
- ...could just run simple busserver
- ...but more sensible if higher level (run controller, daq producer, other services via CORBA?)

## Crate CPU Functions

- Run controller(s) for the crate (standard or custom?) (read database, configure modules, load trigger, start/stop run actions, producer for test/calib events?)
- CPU runs other run-independent (monitor?) processes
- All hardware action via high level services (allow low level access via busserver?)
- Controls access to its modules (Resource Manager?)
- NB System crate/workstation has overall run controller for level 1 calo trigger system

# High Level Services

## OO Analysis

- Already have (untested) schema for a TTC partition
- What services should be provided by a Crate object?
- What data is required by a Crate object?
- Same questions for Module, etc

## Crate Object Services

- LoadTrigger() == LoadCalibration() + LoadPhysics() [Processor]
- ReadCapturedEvent() [ROD crate]
- History of previous actions: avoid repeating lengthy steps unnecessarily?

# DAQ for Slice Tests

## Scope

- Aim for prototype of the final system, so
- test as much of our hardware performance
- and develop as much of our software functionality
- and exercise as much DAQ -1 infrastructure
- as our limited effort permits

## Untried DAQ -1 Aspects

- Resource Manager
- Diagnostic Verification System
- Test Manager
- Anything connected with Dataflow

# DAQ for ROD Tests (1)

## Scope

- Test ROD concept and behaviour
- Starting point for slice test developments...

## "Decisions"

- Use DAQ -1 backend services (RC, IS, MRS, PMG, IGUI)
- But our own dataflaw (PBM, run state)
- Standard architecture: control, producer, analyser, buffer manager
- Use ATLAS event fragment format
- HDMC for low level hardware access and busserver
- ROOT for distributed histogramming and presentation

## "Indecisions"

- Architecture of Module class
- Basis of analyser/monitor (separate or HDMC like?)

# DAQ for ROD Tests (2)

## Existing

- ROOT based histogramming: filling, network serving, displaying
- Beginnings of customised run controller
- Integration of some old DAQ stuff in new system (daqctl)
- Simple GUI for IS based run parameters
- Noddy test of readout ideas

## Not Existing

- New producer
- New analyser/monitor
- Run state communication
- IGUI panels
- etc

## Other Issues

- Multithreading (listen and do useful work)
- Use of proper database (instead of IS)

# Dormant Issues (1)

## TTC Software

- Class structure for TTC partition by Kithsiri
- Documented
- Test program (using old diagnostics classes)
- No further work done

## Calibration

- Different calibrations identified
- Requirements on and capabilities of calorimeter calibration systems is known
- Some thought on procedures/algorithms
- Short document (email/requirements doc section)
- No further work done

## Database

- List of configuration data exists
- Initial thoughts on database schema
- Some interaction with CTP
- No further work done (by us)
- ...though Ralf Spiwoks has:
  - started some work on a trigger configuration schema
  - discussed common approaches with PESA group (L2,EF)
  - hopes to do more and report at our next meeting

# Dormant Issues (2)

## DAQ -1 in the ROD crate

- Good contacts with DAQ -1 backend group
- Some experience of DAQ -1 backend services
- BUT little interaction with dataflow group
- We need to follow (and contribute to?) progress on ROD crate DAQ
- Event building from several ROD crates?

## Documentation

- Various draft or ad hoc documents
- No central place to store informal stuff

# Software Tasks

## Main areas

- Architectural thinking (and documenting!)
- Run controller(s): normal and calibration runs?
- Test/diagnostic programs
- Hardware access library used by both the above
- Monitor programs
- Various utilities (database editor?) etc

# Software Personnel

## Changes in the last 12 months

- Bruce arrived at RAL
- Kithsiri left
- Tara retired
- Volker writing up diploma

## Expected changes

- Scott leaves soon?
- Gain 0.3 of new RAL post

## Unchanged?

- Bill
- Cornelius
- Murrough
- Norman